REMARKS

No new matter has been added. The amendments to the claims address typographical and spelling errors, and improve antecedent basis. The amendments do not surrender any scope of any claim as originally filed.

The Applicant again requests entry of the amendments as set forth herein prior to examination of the application on the merits.

Respectfully submitted,

Laurence B. Bond
Registration No. 30,549
Attorney for Applicant(s)
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110-2550
Telephone: 801-532-1922

Date: August 15, 2005

LBB/tlb

\\Traskbritt1\Shared\DOCS\3129-6838US\125942.doc

APPENDIX B

(VERSION OF SUBSTITUTE SPECIFICATION EXCLUDING CLAIMS WITH MARKINGS TO SHOW CHANGES MADE)

(Serial No. 10/528,225)

PATENT
Attorney Docket 3129-6838US

NOTICE OF EXPRESS MAILING

Express Mail Mailing Label Number: _____

Date of Deposit with USPS: _____

Person making Deposit: _____

APPLICATION FOR LETTERS PATENT

for

PROPULSION MOTOR

Inventor:
Jose Da Conceicao

Attorney:
Laurence B. Bond
Registration No. 30,549
TRASKBRITT
P.O. Box 2550
Salt Lake City, Utah 84110
(801) 532-1922

TITLE OF THE INVENTION

PROPULSION MOTOR

BACKGROUND

[0001] The present invention ~~report~~ reports to an improvement in the motor and processes and from the state of art, relative to ~~an~~ a reaction motor ~~whit~~ with nuclear fuel, ~~whit~~ with purpose to propulsion spaceships, prototypes ~~and rockets~~ a rocket ~~whit~~ with specific impulse 10^5 sec or more, more than obtained for nuclear fission reaction (only comparable ~~whit~~ with micro fusion) or chemical reactions, due ~~to~~ to a high temperature ~~and~~ and a high velocity from the thermonuclear fusion reactions, the impulse is greater than in the DT ~~models~~ models, due to the ~~high~~ high-ignition temperature in nuclear reactions of the fuels in the present invention ~~fuels~~, and ~~too be~~ to be charged particles, how in the DHe3 reaction, a proton of 14.7 MeV (indeed, ~~an~~ a neutron of 14.3 MeV) and an alpha particle of 3.6 MeV, or 100% in charged particles. Due to repulsion ~~by~~ by a magnetic field of the charged particles, also ~~not~~ to not permit the hot plasma to touch ~~materials~~ material walls that the exhaust is made, to has an idea, tokamaks support 300 ~~millions degree,~~ million degrees or the fuel T_x DHe3 to furnish greater impulse in the same power by reaction, ~~that~~ what is ~~need~~ required is lower fuel mass by reaction, or millions of degrees and thousands of km/s also proportioning high thrust (nuclear micro explosions) due to ~~high~~ high-energy density and ~~temperatures.~~ temperature. Beyond the ~~beans~~ beams ~~too~~ also being produced by micro/mini fission or micro fusion reactions, having ignitions (explosions) of this fuel, ~~whit~~ with cylindrical or spherical target, or any other processes of inertial fusion/fission (z-pinch, MTF) to ~~generation~~ generate micro fusion/fission ~~and therefore~~ and, therefore, the beam.

SUMMARY OF THE INVENTION

[0002] The fate to mention a prototype, ~~why is~~ the more simple object is linked to the motor, slowing the mass motor that will be scaled ~~after. Will~~ after, will be a test prototype that will ~~carry~~ carry a reading tool and cameras.

[0003] In ~~the before~~ Patent No. 9303792, the motor is made up ~~from~~ of two cone trunks placed ~~to some~~ some distance ~~from~~ from one another. In the short cone and around, has many energetic ~~beans~~ beams fired to the target (inside short cone), ~~tolerate~~ tolerated ~~only~~ only by illumination by indirect drive, due to that configuration. Beyond the target stay restricted to a small area to be fired by the drivers.

[0004] In the ~~petition~~ Petition No. 9715026, ~~like~~ as in the technical exam opposition from this petition, the drivers are internal ~~between~~ between the exhaust and motor revestment ~~madding~~ producing an angle less than 90 degrees in the z-axis (cone weight) ~~not~~ and not forming ~~full~~ a full direct drive, or corona formation, although some mirrors are placed in a not specified ~~local,~~ locale, as well as in that opportunity in the technical exam opposition the novelties ~~was~~ were omitted to be ~~write~~ written in the claims.

[0005] In the Scientific American from ~~jan\99,~~ January 1999, the model is the ~~micro-~~ micro fission fusion in the exhaust, like in the ~~2/nov/97,~~ November 2, 1997, Super Interessante, the ~~drive~~ drivers are ~~externs~~ external to the body motor, and fired to the target ~~that~~ which is placed inside a half cylindrical bottle, ~~that~~ and is a completely different conception. Later in the Internet NASA ~~pages~~ pages, the driver was generalized for inertial fusion ~~in 14/06/01,~~ on June 14, 2001, ~~whit~~ with the purpose ~~to initiate an~~ of initiating a micro fission and after a micro fusion in the exhaust (Advanced propulsion concepts), including the VISTA model, whose drivers are placed behind ~~an~~ and parallel to exhaust cone weight and directed by mirrors to nuclear ~~fuels~~ fuel targets, and the reactions take place in the exhaust base short cone, and in the present invention some laser guns are inclined and ~~another~~ others are perpendicular ~~to~~ to the z-axis and in enough ~~number~~ numbers placed in the exhaust cone tall base, that is, in the opposite side ~~from~~ of the VISTA model for fast ignition case, ~~whose~~ with the need for corona formation ~~and in~~. In other ~~another~~ cases in the present invention, the ~~drive~~ drivers are placed and generated in a reactor vessel room between the exhaust external motor structure.

[0006] The limitation in the nuclear fuel is another problem, ~~before~~ prior to the Patent case, be restricted to a DT and DD making a reasonable neutron quantity, carrying 80% energy, needing hard structures (rising motor mass ~~whit~~ with this fuel and ~~loosing in~~ losing velocity) to ~~product~~ produce more fuel or to absorb neutrons. The DD ~~reaction~~ reactions ~~make~~ produce tritium, having, ~~therefore~~ therefore, DT reactions, yet the temperature needed in the ignition

of DD reactions is a billion Celsius degrees and in the DT ~~reactions~~ reaction, 100 ~~millions~~ million Celsius degrees. In the DHe3 ~~reaction~~ reactions are ~~need~~ needed 600 ~~millions~~ million Celsius degrees and in the T_XDHe3, 300/400 ~~millions~~ million Celsius degrees.

[0007] ~~Therefore in the VISTA model~~Therefore, the fuel is DT in the VISTA model.

[0008] In ~~the petition~~ Petition No. ~~9715026~~ 9715026, the fuel is DHe3, and in the micro fission ~~fusion~~ fusion, the fuel is Uranium and DHe3 (ICAN-I).

[0009] ~~In the~~The ICAN-II was generated ~~to~~ by DT and DHe3 and initiated by micro fission ~~in 14/06/01~~ on June 14, 2001.

[0010] Another problem ~~whit~~ with the proposed fuel is that the stored quantity for the motor mainly for interstellar travel, and in the VISTA case are 4000MT.

[0011] Another problem is that the energetic ~~beans~~ beams proposed ~~in the~~ in Patent No. 9303792 ~~not was~~ were not specified to initiate second generation nuclear fusion fuels (~~neutron~~ neutron-free or ~~low~~ low-neutron concentration to initiate nuclear fusion reactions) needing more powerful ~~beans~~ beams configuring how conventional ~~beans~~ beams or only get the compression or corona formation, although ~~use~~ of advanced fuels ~~be~~ is a rarity, ~~but~~ however, this is solved.

[0012] In ~~the petition~~ Petition No. 9715026 the ~~driver was~~ drivers were mentioned but not specified, and in the technical exam ~~opposition was~~ opposition, were omitted.

[0013] The driver in the VISTA model ~~are, beans~~ is a beam ~~of~~ of a conventional laser, without mention ~~to~~ of another nuclear fuel or another energetic beam.

[0014] In the micro fission fusion, the ~~driver are beans~~ drivers are beams of antimatter or antiparticles (ICAN-I), generalized to present laser and particle ~~beans~~ beams ~~in 14/06/01~~ on June 14, 2001, (ICAN-II) to initiate micro fission and after DT and DHe3 fusion reactions inside the exhaust, ~~where we can look~~ is another conception.

[0015] Another problem is the exhaust vessel ~~elaboration~~ elaboration, where in the ~~before~~ prior Patent due to nuclear fusion fuels, ~~need~~ needs many shields (5) to protect magnets, to breed tritium ~~for made news~~ to make new fuels. In the DD reaction where the specific impulse is the best, but only DT does not furnish enough temperature to ignite DD without He3, ~~that no mention~~ and is not mentioned in that document.

[0016] In ~~the petition~~ Petition No. ~~9715026~~ 9715026, the shield modification is ~~mentioned~~ mentioned, but not specified that can be noted change according ~~the~~ to the fuel to be used. In the present ~~invention~~ invention, the shield ~~change~~ changes to ~~lowering~~ lower motor mass ~~that~~ so that to ~~near made difference but to interstellar travel no much~~ travel relatively short distances it made a difference, but for interstellar travel, it did not make a difference.

[0017] As well as, in the VISTA model that is at DT but not use the producer shield since carry your own fuel, second that model are 4000MT of fuel, are preferable the producer shield or a reaction vessel if the case is to produce as much fuel whatever the x-ray or ~~gamma~~ gamma-ray mean drive, how is in the present invention.

[0018] ~~In the micro fission fusion (ICAN-II due~~ Due to exhaust configuration in the micro fission fusion (ICAN-II), how can support 600 ~~millions~~ million degrees ~~without~~ without a magnetic field, that ~~is~~ is, to avoid ~~this~~ the hot plasma and to arrive ~~the~~ at the exhaust ~~material constitution if~~ constitution. If so, the tokamaks ~~not need~~ do not need a magnetic field, moreover in the motor ~~that~~ which, in some ~~cases~~ cases, the explosions ~~has~~ have 20 ~~ton~~ tons of TNT or more, or the exhaust vessel may be very large, ~~for~~ so the radiation ~~don't~~ does not touch the wall.

[0019] Another problem is that the present drivers, after ~~9~~ nine years from ~~before~~ prior Patent have not yet ~~begin~~ begun the ignition and combustion. The present invention ~~show,~~ illustrates how to obtain ~~beans~~ beams ~~whit~~ with enough intensity without ~~wait by~~ waiting for before-mentioned drivers, and ~~in an~~ in a simple manner one can test the system at any time ~~whit~~ with micro fission or mini fission (which can be obtained at any time) and the fusion, agreed description ~~ahead,~~ mentioned hereafter where in some cases, many ~~beans~~ beams can be generated at one time. The novelty beam of the present invention can be used in ICF reactors ~~to~~ for energy production.

[0020] Already in the ~~Microfusion,~~ micro fusion, indeed ~~detonation~~ detonation like in Orion project explosions nearly kt intensity, explosions nearly ~~ton~~ tons of TNT where the fuel is U_{235}/DT composite, in some low quantities, but low quantities are not as useful for propulsion and military explosions, but ~~good to make~~ are sufficient enough to produce the beam. The advantage ~~from~~ of the present invention is that explosions take place in a reactor room vessel ~~madding the~~ producing a beam that will fire only fusion in the ~~exhaust~~ exhaust, giving greater specific impulse rather than fission initiated, scaling the present invention to advanced fuels in

the exhaust. Beyond the storage mass ~~needed~~ needed, even in a track near the frontier of our Solar system is a storage mass that is 50 times greater than needed to make the ~~beans~~ beams ~~being a~~ due to the problem ~~store~~ of storing so many radioactive ~~material,~~ materials and the exhaust will ~~need~~ need a heavy shield due to ~~neutrons~~ neutrons, since 1 ~~ton~~ ton of TNT and the neutrons are lethal to 100 m.

[0021] The Vasimir project and the gas dynamic mirror (GDM), that consist to ~~made~~ produce and inject a plasma (~~fusion~~fusion, or not) that is retained in a cylindrical vessel by magnetic fields, where this plasma is heated by radiation in the Ghertz generated by an antenna, was projected to initially work at hydrogen plasma and not fusion, what will happen after get fusion and ~~your~~ the velocity is near 30 km/s.

[0022] ~~Therefore~~Therefore, the purpose of the present invention ~~consist~~ consists in obtaining a solution for the ~~above~~ above-mentioned problems. The chirped pulse amplification (CPA) has the merit to change present laser ~~beans~~ beams from kJ in laser pulse nearly 10^{20}w/cm^2 or ~~more~~ more, but has ~~another~~ other lasers and particle ~~beans~~ beams in this intensity, being actually possible ~~whit~~ with ~~this,~~ this to ~~initiate a~~ initiate nuclear micro reactions in the reactor or vessel of contention (and not in the exhaust) cited in the present invention, or even neutron ~~beans~~ beams generated by a laser to initiate ~~an~~ a micro fission in the reactor room or reaction room.

[0023] According to micro ~~explosion~~ explosion, intensity ~~not is~~ is not useful to propulsion, ~~therefore~~ therefore, today make nuclear fusion in ICF, but in the MJ and without ~~get~~ receiving ignition or target combustion. Some inertial fusion ~~processes~~ processes, like z-pinch and ~~MTF~~ MTF, are adequate to ~~make~~ produce radiation energy, wherein the reactions happen in a billionth of a second duration (same time that ~~take~~ it takes radiation to reach the cylinder in the Centurion/Halite project), without has, therefore, fuel ignition or without chain ~~reaction~~ reaction, however ~~produce~~ produces enough energy in ~~due~~ the form of ~~x-ray~~ x-rays and ~~gamma-ray~~ gamma-rays that are more piercing and useful to direct ~~drive,~~ drivers, that is one of the conceptions used in the ~~beans~~ beam's elaboration proposed in the present invention ~~madding~~ making some adaptation in the fuel. In this ~~technique~~ technique, searching a fuel micro explosion ~~whit~~ with a conventional ICF method or not (or with chemical high explosives) from micro fission and micro fusion ~~in~~ to aid ~~the~~ in the energy production in radiation form, ~~what~~

which is more simple to ~~get,~~ achieve, because in a nuclear explosion the radiation ~~travel~~ travels at light speed reaching the cylinder placed near the nuclear micro/mini ~~explosion,~~ explosion before any other hydrodynamic phenomena and in a reactor placed out of the exhaust to ~~generation~~ generate the beam that will be directed to the target inside the exhaust vessel. In another case (0,1g P_U) detonation ~~whit~~ with chain reaction, that can be retained in a steel or carbon composite vessel ~~(7,5m~~ (3,5m in diameter) inside and lead out, since ~~whit~~ with 1 ~~ton~~ ton of TNT the neutrons are lethal at 100m, and ~~set~~ since so many ~~cylinder~~ cylinders are ~~need~~ needed (the minimal ~~possible~~ possible, due to specific impulse) to beam formation directed to the target inside the exhaust, or using mirrors to ~~direction~~ direct ~~that beans~~ the beams to a fission/fusion reactor, like z-pinch RTL to breed tritium, inside the spaceship with the energy purpose and the elements ~~need~~ needed ~~to another beans,~~ for other beams, ~~what~~ which is an advantage and a novelty.

[0024] To deliver the target and ~~made~~ to make possible an ~~atualization~~ actualization of the two illumination type (direct/indirect ~~drive)~~ drivers) and several ~~beans~~ beams and fuels, that is advanced fuels ~~whit~~ with low tritium percentage constitution, or catalyzed by tritium, or only pure advanced fuels. Target position can vary from cone center to exhaust tall base cone and the exhaust cone ray ~~too~~ also in models ~~whit~~ with advanced fuels or that ~~need greater~~ require more energy than micro explosions.

[0025] ~~For whit this~~To obtain reactions initiated by DT, and how mean fuel DHe3, ~~whit~~ with fast ignition concept what must last a long time in present experiments or use the direct drive illumination since a ~~petawatt~~ pettawatt laser (PWL) directed by direct drive to a DT target, will only ~~will to~~ expel the electrons of the ~~fuels material~~ fuel materials without accomplishing its finality. Therefore, there is a need for, ~~therefore need~~ the corona for laser matter interaction or change target constitution and the beam. ~~Where is need two drivers,~~What is needed are two drivers, one ~~to~~ for corona formation (LIF, HIF, laser) and a ~~high~~ high-power laser to inject a hot spot ignition (fission/fusion in cylindrical/spherical target beam, micro Centurion/Halite, future ~~high~~ high-power laser) the ~~drivers~~ drivers' position is inside, between the external revetment and the exhaust cone, ~~therefore~~ therefore, this configuration ~~require~~ requires more mass in the beam, but less mass than ~~in~~ in a conventional ICF.

[0026] ~~By indirect drive,~~For indirect drivers, that do not need corona formation, but only need a powerful driver to bath the holhraum and x-ray ~~generation or~~ generation, the proposed ~~beans~~ beams where directed to the target, ~~whit~~ with a change in the target constitution.

[0027] The next generation drivers ~~has~~ have a tendency to be compact and powerful, and ~~whit~~ with ~~one~~one- or ~~two~~ two-sided illumination obtain primary fuel fusion, and since the mean fuel, the catalyzed and advanced, the present invention proposed ~~beans~~ beams, that in some ~~case~~ cases may be placed in front ~~of~~ of the exhaust short base cone, or ~~in~~ on the opposite side ~~to~~ of the exhaust tall base, lowering the extra mass of the laser/particle gun by indirect drive, or by direct ~~drive~~ drive, ~~whit~~ with a target to x-ray gamma-ray absorption.

[0028] To ~~make~~ produce the energetic ~~beans~~ beams that will possible pure advanced fuels can mount an inertial fusion/fission reactor to ~~generation~~ generate the beam and obtain ~~an~~ a variety of intensities scaling ~~whit~~ with mass used in each micro explosion in reactor and the cylinder used to simulate the x-ray, ~~gamma~~ gamma-ray laser, ~~like in~~ similar to the Centurion/Halite, in this case, can be placed in the exhaust tall base cone and out of external revetment from the exhaust, ~~whit~~ with this, can change the intensity from reactor micro/mini explosions ~~whit~~ with the purpose to obtain more powerful ~~beans;~~ beams, because in ~~a x ray~~ an x-ray ~~laser~~ laser, so much more intense will be the source pumping greater than will be the laser intensity, or is proportional to the intensity of detonation, by one's turn is limited to mass in the detonation due ~~to~~ to a specific impulse. Comparatively, being possible the detonation of 1kg P_U initiated by laser and magnetic fields or chemical high explosives, in this case the velocity is near 26 km/s due ~~to~~ to a specific impulse, the same order of magnitude from z-pinch LMTL second the following equation (1):

$$V_{ex}=\sqrt{2}E_{PN}/m \quad (1)$$

where V_{ex}= exhaust velocity(km/s); E_{PN} = energy production in each nuclear reaction (GJ); m= fuel target mass (kg). In this ~~case~~ case, the expended mass in the beam generation by any processes (cylinder mass used to beam generation + fuel mass to beam generation + fuel mass used in the exhaust).

[0029] The laser and particle ~~beans~~ beams can be changed in some places in the reactor room or vessel of contention where the beam is generated and in the terminal part by mirrors

directed to the nuclear field target in the reactor to generate the beam, lowering the mass in the reaction room due to laser guns.

[0030] The energetic beam system in some cases, for fast ignition concept, ~~where~~ first ~~use~~ is used a ~~low~~ low-power beam (conventional particle ~~beans~~ beams and laser beams) only ~~to~~ for corona formation and after a ~~high~~ high-power laser (fission fusion x-ray/gamma-ray laser, or ~~x-ray~~ x-ray ~~beans~~ beams by nuclear pumping) to heat the fuel to ignition conditions, beyond ~~to introduce~~ introducing low tritium ~~proportion~~ proportions in the constitution in the exhaust nuclear fuel (T_XDHe3) that has ~~low~~ a lower temperature ignition than DHe3 and having ~~low~~ a low neutron production ~~needing~~ requiring a less dense shield, or DT ~~madding~~ producing a wafer type to insert DHe3, and when the system ~~will~~ is optimized ~~use~~ to use metallic hydrogen in the DT ~~micro~~ microspheres constitution for ~~detonation~~, detonation. DHe3 ~~inserted~~ is inserted in the ~~micro~~ microspheres~~, or~~ for a greater deuterium proportion to initiate DD reactions ~~that need high~~ require a higher temperature ~~from~~ than the DHe3 reactions.

[0031] When the energetic ~~beans~~ beams to be used ~~is~~ are the fission/fusion ~~whit~~ with cylindrical or spherical target ~~directly~~ directly, or by a reactor, can get advanced fuel ignition without the need for low tritium proportion, ~~but need~~ with the need for some symmetry in the beam impact in the fuel target (spherical/cylindrical) due to direct/indirect drive. How are energetic ~~beans~~ beams and conceived from a singular reactor, placed in the interior between exhaust cone and internal revetment and in the exhaust tall base cone. Varying mean beam intensity according to reactor fuel mass, or in the case where don't need very intense micro explosions or in the case ~~of~~ of a single HIF beam are directed against a cylindrical DT_XHe3 target, the driver system is placed in the exhaust short base cone. Due to the reduced number of guns needed ~~whit~~ with this ~~beans~~ beam ~~reduce~~ reduction ~~the mass motor too, as well as a reduction in the mass motors,~~ since ~~whit~~ with fission explosions less than ~~1 ton TNT~~ 5 tons of TNT is more practical than a fusion micro ~~explosion,~~ explosion compared to beam generation. An example is detonation of 10g/50g from P_U by chemical high explosive that is more compact than any other method, and more ~~cheap~~ economical. One possibility is across cylindrical millimeter chemical explosive lenses initiated by the laser or conventional detonators, depending ~~in~~ on the type of lenses, and the millimeter/centimeter cylinder distributed around the Pu/U sphere, that ~~generate~~ generated blast waves ~~madding~~ making a symmetrical compression, ~~like in~~

similar to classical ~~lenses~~ lense bombs. The modern ~~low~~ low-yield thermonuclear ~~explosions~~ explosion has been substantially microed from football sized pack back to gum, or grapefruit size in SADM configuration, like a micro nuke bomb, but an English site made an allusion ~~of~~ of a series of lenses in a bi-conical shape, composite of classical nuclear material, but this can be developed not for war, but for the purpose of the present invention. Likewise, is a reactor ~~will has to~~ that will retain fission/fusion explosions ~~(like in table 1)~~ and radiation to produce ~~a~~ an energetic beam ~~and then~~ which is directed to the target in the exhaust, not raising the ~~mass~~ mass, because in all ~~before~~ before-mentioned documents the reactor and the beam are the same thing or the external ~~beans~~ beams are directed to the target inside the exhaust ~~madding~~ producing this set the reactor.

[0032] The motive ~~by which are find~~ to discover fission reactions less than 10 ~~ton~~ tons of TNT is ~~that~~ the order of magnitude, the need to initiate fission reactions in this scale is in the kJ, that can be verified is the same order of magnitude from liberated energy composite ~~B~~ B-type explosives, or with ~~very~~ less quantities ~~from~~ than chemical explosives being possible with present lasers (micro mini chemical explosive lenses initiated by laser, generating blast waves in many points of a sphere) but difficult to compress such mass, ~~however~~ however, in ~~fusion~~ fusion, the laser energy is near 2MJ that is the present ~~drive~~ state of art. The micro fission can be initiated by laser, mini fission is actually not far beyond this ~~beyond~~ fission can be modeled ~~the~~ in the explosions and the explosions result (radiation, blast, ~~heat,etc)~~ heat, etc,) and the mini fission can be obtained with few mass (W 54 light detonation) or less, or light variations of SADM. Or through present invention with laser, ~~particles beans~~ particle beams and magnetic fields, will ~~see~~ be discussed ahead.

[0033] But the plutonium choice is due to critical state be obtained with less mass quantity than uranium. But the need of plutonium is high 1/4kg for each laser shoot, without chemical ~~explosive~~ explosives needed in the detonation, or if ~~was~~ it were ~~possible~~ possible to initiate with laser or particle ~~beans~~ beams and with magnetic field compression, even ~~so~~ so it will ~~has~~ have a velocity near 26km/s, since z-pitch LM-TL for propulsion ~~need~~ needs 80kg and will ~~has~~ have 30km/s with an explosion near 1kt.

[0034] Another solution with the proposed method ~~is~~ is to obtain the beam across micro inertial fusion reactor, ~~lowering~~ considerably lowering the order of magnitude from matter

needed for mean drive elaboration across a target of ~~low~~ low-temperature ignition (high density), once the order of magnitude in driver intensity is ~~ten~~ 10 kJ, lowering beam intensity in a cylindrical target ~~how~~ is proposed, concentrating the energy in a cylindrical axis rather than ~~a~~ in a sphere. ~~Being t~~The computer simulation being confirmed ~~this~~ by this method will be one of more practice. ~~How has~~However, this has been emphasized ~~this~~ and is important due ~~to~~ to a specific impulse. Micro fission ~~needs~~ requires drivers from greater order of magnitude than micro fusion, but ~~more easy~~ are easier to ~~get~~ get, in some cases. ~~With f~~Fission can diminish the nuclear fuel mass without ~~loose~~ losing detonation intensity.

[0035] The plutonium ignition temperature is near 1keV since ~~is~~ it is DT ~~5keV,~~ 5keV and DHe3 30keV. ~~Comparatively~~Comparatively, 1,23g of plutonium with ray 0,004cm, the driver energy necessary to initiate the reaction is 10/24 MJ and ~~produce~~ produces $4,1.10^{17}$ erg, ~~therefore~~ therefore, in a plutonium sphere with ray of 5cm will be ~~need~~ needed laser in the kJ, since the energy in the B composite is near ~~5MJ~~ 5kJ for each kg, being ~~need~~ needed 110kg giving ~~550MJ,~~ 550kJ, but difficult to compress such mass with present drivers and the plutonium ~~produce~~ produces in this reaction $2,4.10^{18}$ erg one order of magnitude more than micro fission generating thermal ~~x ray~~ x-ray radiation in the explosion near 10GJ enough to ~~made~~ make x-ray and gamma-ray laser in this intensity and initiate fusion reactions inside the exhaust and 3kg of plutonium ~~produce~~ produces 0,004kt, i.e., $1,6.10^{18}$ erg in some conditions, or W54 variation ~~weighting~~ weighing near 16kg and ~~produce~~ produces 10 ~~ton~~ tons of TNT. However with 0,1g from plutonium (with DT mass variation in the plutonium center), the driver order of magnitude is 1MJ (promptly obtained) with the help of magnetic compression or magnetic isolation, can reduce ~~yet more~~ the incident driver energy, but with enough production generating without DT in the fission mass 1.7 ~~ton~~ tons of TNT to ~~generation~~ generate the proposed energy driver and ~~raising~~ raise fuel pressure and the density ~~the~~ of the critical mass ~~fall~~ falls with the fuel mass lowering beam intensity needed, or the ~~critically fall~~ critical falls with fission mass. Lowering the P_U mass to 0,01g with or without Be reflector ~~falling~~ reduces the energy needed in the beam to 100kJ and ~~produce~~ produces 0,17 ~~ton~~ tons of TNT, ~~i.e.~~ i.e., 714 MJ and 10% fuel burn 71,4 MJ. Like in a nuclear explosion 50% is in ~~x radiation,~~ x-radiation having the beam intensity near 36 MJ, 20 times all NIF ~~beans.~~ beams. The objective is not made a nuclear artifact, but this analysis ~~show~~ shows that the objective is to obtain ~~a~~ an ignition (detonation) ~~in~~

large enough ~~size where~~ that x-ray or gamma-ray from such micro explosions ~~come~~ can vaporize a cylinder with ~~x ray~~ x-ray transparence material (low Z material) in the cylinder extremity ~~madding~~ making the laser, where the following ~~table 1~~ Table 1 ~~show~~ illustrates the minimal P_U/U mass values to ~~make~~ produce the beam and enough ~~intensities~~ intensity for nuclear fuel ignition ~~scaling~~ by scaling explosion if ~~need~~ needed, according ~~with~~ to intensity need.

Fuel mass(g)	yield(ton TNT)	10% burn(ton TNT)	Equiv. (J)	Diam. Expl.	Driv. Eng.
0,001	$1{,}76.10^{-2}$	$1{,}76.10^{-3}$	7,4MJ	~~1,60m~~0,42m	10kJ
0,01	0,176	$1{,}76.10^{-2}$	74MJ	~~3,40m~~0,92m	100kJ
0,1	1,76	0,176	740MJ	~~7,50m~~1,97m	1MJ
1,0	17,6	1,76	7,4GJ	~~16,0m~~3,50m	0/20MJ

[0036] With this analysis arrive at proposed driver, initiated by micro fission fusion, that ~~consist~~ consists of cylindrical tube ~~make~~ made up of gold, aluminum, or tantalum in one side fulfilled with ~~0,01/0,02g~~ 0,1/0,2g from uranium plutonium with DT mass 1 μg in plutonium center. In this ~~technique~~ technique, it can use solid or hollow cylinders bombarded with ~~particles beans~~ particle beams by direct drive. With ~~particles beans~~ particle beams, the model that ~~give~~ gives greater pressure and temperature is the hollow cylinder configuration and the beam with annular spot (hollow beam) and with the same cylinder fuel ray being symmetrically heated by incident circular beam and ~~made~~ producing the plasma compression in the cylinder axis that can be ~~inject~~ injected into a fast ignition energy through a gold cone perpendicularly directed to this axis. With laser by direct drive are possible explosive shock waves with solid cylinder ~~target~~ targets and the laser beam directed to the cylinder axis. Being ~~gold~~ gold, the cylinder material and using the PWL and due to its ~~intensity~~ intensity, many nuclear processes happen when it is ~~shock~~ shocked with the solid material and due to material type and some processes manifest more than others. For DT ~~compression~~ compression, ~~are need~~ two shields are needed, one of gold where the PWL ~~expel~~ expels the electrons and this shocking with aluminum ~~produce~~ produces x-rays that heat DT to the ignition point. P_U compression ~~only need~~ requires a gold shell ~~for~~ to be reached by PWL producing neutrons, anti-matter, ~~etc~~ etc., in this nuclear ~~processes~~ process that arriving the P_U shield ~~join~~ joins with the shock wave made by the laser impact ~~with~~ with an Au shell ~~make~~ produce the fission of P_U. The evolution to fast ignition is adapting a gold

cone (better spot at 30°) to attain the region of compressed plasma with fast coronal ignition method (FCI), where the ignitor beam cone can be in the Pu/U shell and the compression is made in the DT shell, or the ignition beam cone in the DT shell and the compression in the Pu/U shell in cylindrical or spherical geometry. The most adequate is the compression of P_U/U generating neutrons and heating the DT shell and after to ignitor cone, beyond the target normally used ~~in~~ in an ICF search that has a tamper, pusher and the cylinder rod that ~~made~~ produces the laser ~~launched~~ launch separately ~~of~~ from the fuel target in the reactor. ~~Where an~~An idea with CPA laser in the USA is to make an ion accelerator with a CP-A laser. The above idea from the present invention ~~is~~ is to simulate in another scale the Centurion/Halite project, indeed a kt nuclear explosion a micro fission where the ~~high~~ high-intensity radiation from these explosions in a ~~small~~ short ~~time make~~ time made the ~~pumping~~ laser pumping ~~at arrive~~ arrive at a cylinder rod from aluminum or another high Z material and the cylinder is positioned directed to the exhaust target.

[0037] By indirect drive ~~with~~ which both consist in holhraum variations with fast coronal ignition (FCI) but in this case the ~~laser~~ lasers are more efficient to heat the holhraum. ~~Then~~Then, according ~~with~~ to the target ~~type~~ type, the cylinder that ~~make~~ produces the mean laser and is launched separately in the reactor from the fuel target ~~in the reactor~~.

[0038] Another method is to profit the fission facility to diminish mass ~~and with this use~~ using 0,001g of plutonium/uranium (and μg from DT inside this P_U/U shield mass) needing in the ~~beans~~ beams near 10kJ to initiate P_U/U micro explosions and after DT, the x or γ radiation reach the ~~cylinder~~ cylinder, vaporizing it, having transparence lenses to x or γ radiation ~~madding~~ producing this manner the laser, in this ~~case~~ case, the cylinder is mounted in a capsule around the target, ~~i.e.~~ i.e., the target and the cylinder are one thing. Or injecting as well as cylinder whatever the fuel separately across wall orifices in different places not needing the capsule, but is the same principle. Like is a metal your trajectory can be scanned by laser and computer calculations and positioned ~~by~~ a magnetic field.

[0039] The ~~advantage from~~ advantages of this system ~~that~~ are micro explosions that will be retained in a short cylinder from ~~1.76~~ 42 cm in diameter, since ~~explosions~~ explosion diameters are proportional to cubic root explosion intensity, illustrated in the following equation (2):

$$\text{~~d=1.6~~}^3\text{0.32}^3\sqrt{E_{PN}} \quad (2)$$

where E_{PN}(kg TNT) is the nuclear yield, generating the laser with an axial magnetic field in the cylinder ~~bring in to~~ brings into action moments before implosion (beyond to avoid loss of fuel entropy) and retaining the energy in the cylinder, obeying the condition BR>10 Tm, that is possible with present magnetic fields (not z-pinched, but this is possible with z-pinch fields and in a ~~combination,~~combination that is an axial ~~only,~~ only or axial and radial magnetic fields). In the case of the axial magnetic field, the incident driver is a single particle beam (HIF) with ~~your~~ a circular symmetry that ~~arrive~~ arrives at the cylinder fuel shield under the tamper in the reactor target. In ~~another~~ two other cases, the incident driver is the conventional ICF ~~methods~~ method with a radial (or mix) magnetic field. Due to small size dimensions in radial magnetic ~~field~~ field, the energy needed in the magnet can be obtained by storage capacitors that fire ~~in~~ in a short time the energy to the magnet that ~~are of or explode~~ exploded after a time, generating very high compression needed in micro fission reactions, ~~like in~~ similar to a wire array z-pinch. The magneto in ambient temperature and for axial field are ~~madding of cooper~~ made of copper wire strengthened by fine filaments of aluminum, silver or niobium with support from fiber glass or carbon composite generating magnetic fields near 70 T ~~in~~ in a pulsed regime, since pure ~~cooper~~ copper will not support the strong stress that the magnetic field applies to the magnetic, beyond how strong wire diameter less capacity, or without magnetic field, since in this mass scale fission the driver is promptly obtained (ICF or chemical high explosive methods), since this field is used where mass fission ~~raise~~ raises and ~~need~~ requires more energy in the driver to initiate micro fission. The advantage of magnetic fields ~~is~~ is to avoid ~~loss~~ a loss of energy needing less areal density and energy in the beam. This has an advantage ~~on~~ to the z-pinch since the repetition rate is high, ~~therefore~~ therefore, in conventional z-pinch is low (~~only good~~sufficient to feed ~~an~~ a laser ~~with~~ with a high repetition ~~rate like~~ rate, as proposed in the present invention) although ~~produce~~ producing actually 2MJ of x-radiation, more than 1.8 MJ from NIF and ~~with upgrade~~ upgrading to 16MJ in the x-ray driver energy, or in the fast z-pinch, where the z-pinch is adapted to fast

ignition and is used to ~~detonation~~ detonate the fuel inside the exhaust ~~the fuel~~. The ~~difference,~~ difference in the present invention made a x-ray laser, the z-pinch systems made a x-radiation or the z-pinch plasma is launched in the exhaust, beyond in the present invention the x-radiation or x-ray laser radiation is used to make a mean driver in a reaction vessel for after ~~initiate~~ initiating inside the exhaust the nuclear micro fusion of advanced fuels or ~~not~~ not, and has more efficiency than in the micro fission fusion (ICAN-I) that has a relatively powerful and expensive driver to ~~made~~ produce the same ~~thing,~~ results, ~~therefore~~ therefore, after driver generalization (ICAN-II), to initiate a micro fission followed by fusion, but ~~detonation~~ detonates the fuel inside the exhaust.

[0040] Or only fission, since the order of magnitude in the driver energy to generate 10/100MJ is ~~very~~ below ~~from~~ the generated energy in the processes. ~~However~~However, the ~~neutrons~~ neutrons, from DT_X reactions in the plutonium ~~center~~ center, increase the fission reactions simulated in a lesser scale the Centurion/Halite project, having the fuel a cylindrical or ellipsoidal shape.

[0041] In the less-explosive case, the reactor localization is ~~one in~~ on each side of the exhaust tall base cone, internal, between the revetment and the exhaust. In this ~~case~~ case, ~~the~~ it is more practical to initiate ~~a low~~ low quantities of Pu/U (mg/g) by chemical explosive lenses (with 0,5 mg of silver azide ~~were~~ obtained from cylindrical blast waves) initiated by the laser. With the help of nanotechnology in the improvement of high explosives (and raising the chemical mass of high explosive and nuclear explosive in the same proportion) in ~~1~~ one order of magnitude according ~~the~~ to the following calculation, known that ~~0,1gU~~ 0,1gU is ~~need~~ needed 100 kJ in the driver and the energy density of high explosive 6kJ/g calculating the volume the ratio is two orders of magnitude assuming 100% coupling. In ~~fusion~~ fusion, with the same ~~calculation~~ calculation, the volume of chemical explosive is ~~5~~ five orders of magnitude greater. ~~With this will need~~Needed is 1 to 10g of high explosive for detonation ~~0,1g~~ on 0,01g of U being viable the ~~better~~ more practical and ~~cheap~~ economical system to initiate a micro mini fission explosion to ~~made~~ produce the beam ~~and~~ and, in this ~~case~~ case, the reactor is only the contention vessel. The high chemical explosives ~~haven't~~ do not have the velocity and energy to initiate a pure fusion but ~~is~~ are adequate to begin a micro mini fission from the same order of

magnitude from high explosive mass, with fission detonations less than ~~1~~ one ~~ton~~ ton of TNT to ~~make~~ produce the beam~~, according table 1~~.

[0042] ~~When~~When, in a more explosive ~~reactions,~~ reaction, the place ~~of~~ of a reactor is out of motor revetment, or ~~madding~~ made of a ~~3~~ three vessel system where ~~2~~ two of them are placed in opposite ~~side~~ sides ~~from~~ of the exhaust tall base cone, generating the laser beam directed to the target inside the exhaust, or directed to another reactor inside the spaceship. The reactor is able to support micro mini fission reactions. ~~Comparatively~~Comparatively, it is possible to retain 1.7 tons of TNT ~~is possible to be retained~~ in a modest steel vessel, and in the present ~~invention~~ invention, due to ~~magnets~~ magnets, a lead shield is needed to retain the neutrons or carbon-carbon composite having high heat resistance or graphite or a HYLIF configuration to retain the explosions. This conception has advantages ~~upon~~ over micro fission fusion (ICAN I/II, micro fusion), ~~the~~ as the exhaust is free of neutrons from fission, lightening the shields for ~~neutrons~~ neutron free fuels, beyond to proportion a better conception about the reactor or reaction vessel of contention that will generate the driver and how to retain neutrons and being better to manipulate than in the exhaust.

[0043] With nuclear fusion ~~reactions~~ reactions, raising the ~~micro spheres mass~~ microspheres' mass from the exhaust ~~lower~~ lowers the driver intensity, what can be obtained by fast ignition methods or by indirect drive with present drivers. ~~Comparatively~~ Comparatively, in mini fusion to initiate a reaction are used explosive plastic lenses, ~~madding~~ producing an artifact of 10 kg called a "baseball bomb" ~~madding~~ producing nearly 1 ton of TNT. The specific impulse ~~yet~~ is ~~low~~ low, being the mass limit 1 kg. Using the present invention method initiating by laser, ~~particles beans, etc.~~ particle beams, etc., and with the help ~~of~~ of a magnetic field, we can ~~low~~ lower the matter quantity used in the nuclear driver elaboration from milligrams to micrograms, since 1 mg of DT ~~produce~~ produces 334 MJ ~~with~~ while 10% of burn ~~produce~~ produces 33,4 MJ and 50% (x-ray/γ ray) 16,7 MJ in x-radiation or gamma radiation, that is 10 times more ~~energy~~ energy is introduced by laser in the NIF, and ~~5~~ five times more the production of 1 mg of U, ~~agreed~~ see above. This ~~reduce,~~ reduces the mass ~~needed~~ required to ~~make~~ produce fuel, with two reactors in each side of 70 kg/yr that is reasonable for deep interplanetary voyager, and the specific impulse depend approximately of the exhaust fuel.

Model	Driver mass	Exhaust mass	burn %	Cylind. Mass	I_{sp}	v
Vasimir (GDM)	-	?		-	4000	30 km/s
Z-pinch LMTL	-	80 kg		-	4000	30 km/s
Pres. Invention	1 kg	1 g	100	$4x10^{-3}g$	2617	26 km/s
Idem	1 g	1 g	100	$4x10^{-3}g$	88399	817 km/s
Idem	1 g	1 g	50	$4x10^{-3}g$	58972	573 km/s
Idem	1 g	1 g	10	$4x10^{-3}g$	26373	258 km/s
Idem	1 g	1 g	1	$4x10^{-3}g$	8399	82 km/s
Idem	0,01 g	$5x10^{-3}g$	100	$4x10^{-3}g$	83399	817 km/s
Idem	0,01 g	$5x10^{-3}g$	50	$4x10^{-3}g$	58972	573 km/s
Idem	0,01 g	$5x10^{-3}g$	10	$4x10^{-3}g$	26373	258 km/s
Idem	0,01 g	$5x10^{-3}g$	1	$4x10^{-3}g$	8399	82 km/s
Idem	$1x10^{4}$ (Fus.)	$5x10^{-3}g$		$4x10^{-3}g$	81004	793 km/s
Ideal case	0	$5x10^{-3}g$	100	0	83398	817 km/s

[0044] Table 2 ~~has how~~ references how the ~~energy~~ energy is produced by DT and mass of U235 and DT, for DHe3 is the same data but with less fuel mass; burn % = percent of nuclear fuel burn in each case, and the ~~classifycation~~ classification made in internet NASA ~~pages~~ pages, where ~~say~~ it is stated ~~that~~ that a great part of the present projects ~~about~~ regarding fusion, anti-matter, and fission, are not ~~proved~~ proven technologies. ~~Second mine~~A second way of ~~think,~~ thinking ~~that can~~ to go ~~on~~ rapidly on to the next step, or proved technologies, are ~~z- pinch~~ z-pinch LMTL, Vasimir/GDM, ~~microfusion,~~ micro fusion, and the present invention, since some comparative data. To give an idea, the energy production ~~need~~ needed in micro explosion is 144 GJ for a velocity of 30 km/s and a waste mass of 80 kg in the processes and a corresponding fuel mass of 1g of DT and 50% of fuel burn in the ~~z- pinch~~ z-pinch LMTL ~~according~~ according to equation (1). In the present ~~invention~~ invention, ~~with 5 mg~~ 5mg of DT and 1% of fuel ~~burn~~ are burned, the velocity is 82 km/s, the mass consumed by second is 200 times less, and with 30% of fuel ~~burn~~ burned, the velocity is 500 km/s with the same amount of mass (5mg) that is feasible. ~~Yet in~~Yet, in micro fusion (new Orion project) has comparatively the same values ~~from~~ as the present invention, ~~but as~~ but while it ~~go raising~~ raises the yield and

~~using~~ uses advanced ~~fuels~~ fuels, the fusion ~~reactions~~ reaction ~~has great~~ has a greater specific impulse, or with advanced ~~fuels~~ fuels, the mass ~~to made~~ produced is the same ~~thing~~ thing, ~~is~~ near μg. ~~The~~To the ~~contrary~~ contrary, in ~~microfusion,~~ micro fusion, since to ~~have~~ have a great DT ~~yield~~ yield, ~~is need great~~ a greater amount of Pu/U is needed, ~~beyond~~ beyond to be more clean ~~of~~ or nuclear fission defects in the exhaust and ~~better~~ is easier to control in the reactor or reaction vessel.

[0045] ~~For~~To increase ~~velocity~~ velocity, ~~is need~~ many units are accopled to the ship, yet is far from 0,1c, or are need 60 units of 5mg burning 30%, the same analysis for DHe3 but with less nuclear fuel mass, enlarging the traveled distance with the same amount of mass stored, or DD reactions initiated by He3 reactions that ~~has~~ have a specific impulse of 1.8 times more than DHe3 reactions second in the following equation (3), but ~~aren't~~ are not neutron free.

$$I_{sp}=\sqrt{(1/g)(2\gamma/\gamma-1)(R/M)T} \quad (3)$$

[0046] ~~Where,~~When R, ~~g~~ g, and T are present in S.I. units, the. ~~The~~ advantage in ~~use~~ using neutron free nuclear fuels like DHe3, He3-Li6, D-Li6, initiated or not by tritium in propulsion case, where this nuclear reaction ~~are that~~ has charged particles in the products of ~~this~~ these reactions and are neutron free and being well ~~choose~~ chosen will proportion a chain ~~reaction~~ reaction, free of neutrons, making only charged particles, while aiding the thrust. With this it will ~~can to~~ remove the weighted neutron shield, but in every one of ~~this reaction~~ these reactions has a chain ~~reactions,~~ reaction, since some reactions produce neutrons in their reactions and can happen with same probability needing neutron ~~shield~~ shields, but less ~~tick.~~ thick. The protection shield can be removed, since the elements can be efficiently produced in another place at the beginning of the fusion or fission ~~reactions~~ reaction that ~~produce~~ produces this element, ~~remaining~~ remaining, in this case, the first wall, the protector shield and the magnetic field. Or in the case of DHe3 without ~~be~~ being catalyzed the fuel of analogous configurations ~~write bellow~~ right below is detonated by the proposed driver, needing the first wall and the magnetic field, where the material ~~need~~ needed ~~to~~ for the fuel is produced in the reactor(s) together with the mean driver, that is the dry system with the present technique ~~that~~ can support advanced fuels without extreme risk.

[0047] In ~~the~~ this reaction DT-DHe3-DD, or the DT reaction initiate DHe3 reaction that ~~produce~~ produces enough temperature to initiate the DD reaction, that has the better specific impulse to ~~have~~ produce a better ignition temperature.

[0048] In this case, not needing the production shield in the motor, want to have a means to produce D and He3 that can be obtained by laboratory fusion reactions inside the spaceship, ~~therefore~~ therefore, producing tritium that ~~decay~~ decays in ~~12~~ twelve years in ~~He3 therefore~~ He3, therefore, producing ~~deuterium~~ deuterium, if the case.

[0049] For travelers inside the solar system, where ~~need~~ Pu is needed in the driver formation, the Pu can be stored in the optimized target case and be of 0,01g and in the center 1μg of DT, or until solar system periphery are ~~need~~ needed by each fire in a second (can be ~~need~~ more, if needed) and ~~by~~ by a reactor or beam formation 279 kg/year and 31,6 kg/year of DT, without ~~take in count~~ taking into account the fuel mass ~~need~~ needed in the exhaust, maintaining the fission mass and raising the fusion mass to gain better fission ~~burn~~ burn, producing better energy to drive generation, since only 0,01g of micro fission ~~produce~~ produces 0,01 tons of TNT, likewise 36MJ, ~~20~~ twenty times more than ~~energy~~ energy, produced by 192 NIF laser and 1kg (more explosive version) to send in ~~5~~ five years against an asteroid and likewise ~~has~~ has a specific impulse near z-pinch LMTL model from order of magnitude of the evaporated material is ~~in the~~ a ~~ten of~~ tenth of a kilogram, and the ~~velocity~~ velocity, in this ~~case~~ case, is 30 km/s and 50% of fuel burn, and in the present invention with 1kg waste in the driver elaboration. With mini fission in a model ~~more light~~ lighter than ~~W54~~ W54, the velocity is less than 26km/s, or using mini fusion with an artifact ~~called~~ called a "baseball bomb" ~~weighting~~ weighing 10 kg, initiated by plastic explosive lenses or with ~~an~~ a lighter model ~~more light weighting~~ weighing ~~1k~~ 1k, if one day it will be ~~possible~~ possible to initiate fission with 1kg of chemical explosive. ~~Then t~~The ideal will be 10/50g of high explosive micro lenses initiated ~~by~~ by a laser and detonate 10/50g of P_U/U since the quantity of high ~~explosive~~ explosives is equal to quantity of nuclear fuel to be detonated and ~~this relax~~relaxes the need for a fast and efficient coupling between the release of explosive energy and the fuel pellet, or the same with nuclear macroscopic detonations, ~~being~~ if the planetary ~~travel~~ travel is rapidly viable. With 1g of Pu/U to beam formation and 1g of DT or another nuclear fuel and 10% of fuel ~~burn~~ burn, the velocity is 258 km/s. The mass waste in the driver formation has to be less or equal to the mass waste in

the exhaust, or the mass in the velocity equation (1) is the sum of ~~tree~~ three masses, since ~~we~~ they fall in line ~~3~~ 3 in the example of ~~table~~ Table ~~2~~ 2, where the velocity is low. In ~~Supposing~~ the same ~~case~~ case, but with 50% of fuel ~~burn~~ burn, the velocity can be 573km/s and in the worst case 1% of fuel ~~burn~~ burn is 82 km/s. ~~The table 2, show~~Table 2 illustrates that the values are the same for 1g, ~~5mg~~ 5mg, or 100mg, the change in velocity ~~depend~~ depends in burn percent in each case. Then with 10mg of P_U/U is above the cylinder mass and the energy needed in the driver to initiate the reaction is near 100kJ. If the question is lowering ~~mass~~ mass, then the ideal in the driver for propulsion by the present method is the fuel mass near 0,001g of P_U/U that ~~produce~~ produces 7,4 MJ being ~~need~~ needed 10kJ of energy in the driver and this driver ~~how~~ now is less than 10MJ ~~begin~~ which begins a DT reaction after the DHe3 reaction, since a driver that ~~initiate~~ initiates DHe3 combustion ~~only,~~ only is out of cogitation or ~~scaling~~ scaling in the present invention method. ~~In~~In a cylindrical fuel ~~case~~ case, the target is made of shells in the reactor, and the fuel ray is the same size ~~of~~ as the ray spot driver with or without tamper, ~~pusher~~ pusher, and magnetic field. The cylindrical geometry is preferable to mount around the cylindrical target the capsule with the cylinders that will be evaporated by the target explosion, but is possible with spherical and conical fast ignition targets with direct and indirect drive and the laser cylinders that will ~~made~~ cause the laser ~~launched~~ to launch separately from the targets.

[0050] This is an advantage, since ~~will~~ it will now be possible to model and test the system without ~~wait~~ waiting ~~15 or 50~~ fifteen or fifty years.

[0051] In this case, it ~~Case not~~ is not possible ~~obtain~~ to obtain enough fuel by laboratory reactions in the ship, and has to be an option between the fuels, where the candidates will be DHe3 catalyzed reactions, having ~~tritium, that lower~~ tritium that lowers fuel ignition ~~temperature,~~ temperature beyond the exhaust vessel ~~need~~ is needed, the protector shield or the option being by DT detonations that ~~generating~~ generate a progressive shock wave that will arrive DHe3 cold fuel, from this macro nuclear fuel target, this model is adequate for travelers inside the solar system, where there is not a great need for ~~great~~ storage ~~fuel~~ of fuel since it can withdraw the production remaining ~~the~~ in the first wall, the protector shield (tritium) and the magnetic field where this mass ~~compensate~~ compensates the specific impulse, since ~~is~~ it is in~~to~~ the solar system, then the exhaust can support this high fuel temperature ~~600~~ of 600 ~~millions~~ million ~~of~~ Celsius degrees.

[0052] ~~How t~~The driver intensity is 10MJ for pure advanced fuels, that ~~is,~~ is without Uranium or DT, the intensity of the present driver is related to micro explosions that will arrive ~~the~~ at the cylinder, and will be modeled by the before-mentioned method, using fission/fusion according to ~~table 1.~~ Table 1.

[0053] The DT target mass in the micro fusion case is near 1/5μg through LTI target where the order of magnitude need in the driver is in the kJ less than ~~550MJ~~ 550kJ ~~need~~ needed by mini fission method to produce 2.10^9J that is enough to initiate DT reactions and arrive ~~the~~ at the cylinders generating ~~beans~~ beams in the ~~32MJ/320MJ~~ 32/320MJ enough to initiate advanced fuels like T_XDHe3 and others advanced with tritium or by fast ignition ~~methods target~~ method targets and by direct or ~~in~~ indirect driver.

[0054] The motor has magnetic ~~field~~ fields in the exhaust vessel ~~this~~ that ~~make~~ make it possible to ~~rise~~ raise the dimensions of the nuclear fuel target, since ~~raising it~~ raising the mass ~~and consequently~~ and, consequently, the density, ~~lower~~ lowers the energy driver, using the lower temperature ignition (LTI) target in the experiments to energy production or with fast ignition methods in conical targets. The DT seed reactions are enough to initiate DHe3 reaction that ~~is~~ is in the cold fuel in the constitution of ~~micro~~ microspheres.

[0055] Like the drivers proposed in the present invention are in the x radiation, the target constitution (spherical or cylindrical) in the exhaust is plastic, ~~DT~~ DT, and DHe3 or T_XDHe3.

[0056] The nuclear fuel target injection system in the reactor in the case of micro fusion reactions is electrodynamics that is adequate to inject low mass target, and in fission/fusion micro reactions where the target has a capsule with two or more cylinders ~~having therefore~~ having, therefore, a reasonable mass, by electromagnetic means, since inside the capsule ~~have~~ there is a very small quantity of iron to facilitate the injection by electromagnetic accelerator ~~where~~ when a slingshot capsule is accelerated and ~~launch~~ launches the target fuel. The accelerator capsule, ~~levitate~~ levitates like a superconductor train without ~~to~~ touching ~~in~~ the super conductor track, that is braked and the target ~~follow~~ follows by inertia. The target tracking system ~~is by~~ uses cameras and detectors like the following. In the ~~exhaust~~ exhaust, ~~with~~ the targets ~~that~~ can be illuminated by direct and indirect drive and the adequate means is ~~by~~ by a gas trigger ~~where~~ when the work gas is helium or another light ~~gas~~ gas. ~~this~~This method ~~avoid~~

avoids interaction with the exhaust magnetic ~~field~~ field, attaining the ~~targets~~ targets' velocity of 500 m/s ~~needing~~ requiring a gas reservoir ~~and~~ and a valve control, and a cryostat that will store and load the target inside a cylindrical tube of gas. From this ~~point~~ point, the target will go by inertia ~~where their~~ when trajectory is traced by photodiodes ~~or~~ or a laser and cameras are positioned ~~belong~~ along the cylindrical tube of the gas contention and will send information to a computer that ~~calculate~~ calculates the distance and positioning from the exhaust center, since ~~in the~~ the same has cameras and photodiodes diametrical ~~opposed~~ opposed, sending signals and ~~trace~~ traces the tube ~~by~~ with cameras. The target producer ~~system by polymerization~~ system, by polymerization, ~~that make~~ makes resistant polymer and ~~permit~~ permits automatic production and ~~is stored~~ stores it in a cryostat and ~~this~~ is connected to the system injection ~~cryostat~~ cryostat, closing the cycle.

[0057] The exhaust vessel diameter is to support micro explosions between ~~0,1ton/27 ton TNT~~ 1ton/800tons of TNT that is between ~~7.5/48~~ 3.5/35 meters.

~~Go~~Traveling to the stars ~~need~~ requires a motor using advanced fuels ~~with~~ with a maximum reduction in the shields ~~and~~ and a gun driver ~~madding~~ making the fuel and the driver by inertial fusion confinement.

[0058] ~~No~~Not being possible to initiate or detonate at same ~~time~~ time, 50/100g of DHe3 or T_XDHe3 has to be used ~~4~~ four reactors or space of ~~confinament~~ confinement around the exhaust vessel detonating inside the exhaust ~~4~~ four reactions or more ~~in~~ at the same time, or ~~4~~ four semi hemispheres where each center has the same distance from the exhaust center with the advantage to scale the specific impulse since in each hemisphere center many targets can be detonated ~~many targets~~ in a second.

~~[0059]~~Choosing the first wall ~~material like Kevlar~~ material, like Kevlar, that is light and resistant, or carbon-carbon composite alloy that due ~~to~~ to a high melting point (1500°) ~~give~~ gives to the ~~material~~ material a ~~high~~ high-temperature resistance proposed ~~to~~ to the nuclear rubbish container being the support structures of ~~kevlar~~ Kevlar or steel and the magnetic field shield being of ~~high~~ high-temperature superconductors ~~like~~ like a mercury derivative ~~and~~ and a cupric oxide with variations in oxygen concentration ~~when in some cases~~ when, in some cases, ~~add~~ adds thallium or strontium obtaining metallic ceramics of ~~high~~ high-temperature superconductivity reducing the ~~needs~~ need of immersion tanks ~~having~~ containing helium or refrigerated nitrogen

~~refrigerated~~ (in DHe3 ~~what yet~~ when reduced in mass can compensate this hypothesis, beyond high specific impulse) or ~~cooper~~ copper derivatives and ~~ceramics~~ ceramic materials producing magnetic fields near 60T or more, or superconductivity binary alloy of niobium that has the advantage to be transformed in thread and ~~produce~~ produces a high magnetic field, or ambient superconductors ~~where~~ when the candidate is He3 superfluidity will be a ~~the more light~~ lighter system ~~with~~ with a ~~first~~ first-wall refrigerator ~~and~~ and a magnetic field ~~madding~~ producing a test probe of low cost and carrying the needs.

~~[0060]~~[0059] Simplifying: what is ~~need~~ needed is a nuclear fuel, ~~were~~ where happen low intensity ~~(scaling~~ (scaling, if ~~need~~ needed) nuclear fission/fusion reactions in a place (reactor or reaction vessel) destined to ~~made~~ produce an energetic beam that by one's turn will initiate in the exhaust thermonuclear fusion micro reactions of fuels, according ~~with~~ to the finality of the motor near the solar system periphery (DT, DT-DHe3, T_XDHe3) or beyond (DHe3, T_XDHe3, T_XLi6, DT-~~DHe3~~-DHE3-DD) and the beam is directed to these fuels to initiate nuclear reactions and combustion and a magnetic field that will repel (expel) the hot plasma, and ~~yet a mean of~~ is a means to produce and inject the nuclear fuel, without requiring an enormous stored volume.

~~[0061]~~[0060] The invention will be better ~~to understand~~ understood with the following detailed description in consonance with annex figures.

BRIEF DESCRIPTION OF THE DRAWINGS

~~[0062]~~[0061] FIGURE 1 represents one unit and a general motor vision ~~with~~ with a driver system.

~~[0063]~~[0062] FIGURE 2 represents one unit and a lateral motor vision and the disposition of energetic ~~beans~~ beams around the exhaust vessel ~~with~~ with a hemispherical shape, in case of direct drive and corona formation with cylindrical and spherical target and ~~show~~ illustrates many processes.

~~[0064]~~[0063] FIGURE 3 represents one unit and a lateral motor vision and the disposition of energetic ~~beans~~ beams with indirect and direct drive with ~~two side~~ two-sided illumination, and the intensity of explosions the same ~~than figure~~ as in Figure ~~2~~ 2, for advanced fuels.

~~[0065]~~[0064] FIGURE 4 represents the same ~~before~~ situation as in Figure 3, but with explosions between ~~0,02ton/0,04ton~~ 1 ton/2 ton TNT to ~~make~~ produce the x-ray or gamma-ray laser beam ~~with~~ with a cylindrical contention vessel.

~~[0066]~~[0065] FIGURE 5 represents the same ~~before~~ situation as in Figure 4, but ~~with~~ with a spherical vessel of contention.

~~[0067]~~[0066] FIGURE 6 represents the same ~~before~~ situation as in Figure 5, but with ~~in the 0,05ton TNT~~ 5 tons of TNT, or less ~~and~~ and a hemispherical vessel of contention, ~~generating or not~~ generating, or not, a primary exhaust and the beam for advanced fields.

~~[0068]~~[0067] FIGURE 7 represents the capsule that ~~contain~~ contains the target and the cylinder rod for x-ray laser generation.

~~[0069]~~[0068] FIGURE 8 represents the cylinder that will contain micro ~~explosions~~ explosions, in many cases.

~~[0070]~~[0069] FIGURE 9 represents the set of coils that generate the magnetic field in the capsule that will collaborate ~~to~~ with micro mini explosions.

~~[0071]~~[0070] FIGURE 10 represents the reactor target ~~in~~ in a cylindrical shape ~~to~~ to a beam formation.

~~[0072]~~[0071] FIGURE 11 represents the reactor target ~~in~~ in an ellipsoidal shape ~~to~~ to a beam formation.

~~[0073]~~[0072] FIGURE 12 represents the exhaust target ~~in~~ in a cylindrical shape.

~~[0074]~~[0073] FIGURE 13 represents the exhaust target ~~in~~ in a spherical shape.

~~[0075]~~[0074] FIGURE 14 represents the reactor target and ~~their~~ the shields ~~in~~ in a cylindrical or spherical geometry.

~~[0076]~~[0075] FIGURE 15 represents the same ~~before~~ situation as in Figure 14, but ~~with~~ with a high micro magnetic field from capacitor banks or ~~another~~ other processes.

~~[0077]~~[0076] FIGURE 16 represents the reactor target ~~by~~ with a fast ~~gnition~~ ignition ~~in~~ in a cylindrical or spherical geometry.

~~[0078]~~[0077] FIGURE 17 represents the exhaust target injection system.

DETAILED DESCRIPTION OF THE INVENTION

~~[0079]~~[0078] To agree with ~~this~~ these figures and in ~~your~~ the ~~details~~ details, the present invention "PROPULSION MOTOR, PROCESSES AND BEAMS FROM THERMONUCLEAR FUSION MICRO REACTIONS" in conformity with ~~figure~~ Figure 1, the motor is constituted ~~from~~ of two rings (17), linked between it ~~by~~ by a sustentation bar (18) ~~madding~~ making motor external structure (17,18) in the exhaust (13,14,15), linked to ~~an~~ a third ring (17A) and the mean driver reactor room (16) and in number of 4, in the optimized case that is by our ~~turn are~~ turn linked to motor external structure ~~(17)~~ (17), ~~W~~where one or two lasers are operational and ~~tree or two~~ two or three are maintained in reserve for possible ~~repair.~~ repairs. We can observe ~~too~~ the driver system (1) placed into motor external structure (17,18) and externally to exhaust ~~(13,14, 15)~~ (13,14,15) that are illuminated by conventional laser or particles ~~beans~~ beams (2) and generate the energetic beam (8) directed to spherical target (10) inside the exhaust (13,14,15). How are ~~3~~ three shields, and in the case of neutronic reactions, like DT, DTHe3, etc. In this ~~case~~ case, the micro explosions are between ~~0,002 / 0,02ton TNT~~ 0,02 to 0,1 tons TNT producing in the beam ~~14~~ 32 MJ to ~~140~~ 720 MJ with ~~explosions diameter~~ explosion diameters between ~~1.6m to 4.50m~~ 42cm to 1,97m corresponding to cylinder or spherical diameter (6) that will retain the micro explosions ~~like~~ illustrated ~~figure~~ in Figure 2, as well as the fuel target (3) contained in a capsule (5) where inside is the cylinder rod (4) for beam formation (8) that will be ~~arrived~~ arrived at by x-radiation from each micro explosion that is initiated ~~by~~ by the driver system (1). Made the energetic x-ray beam (8) by thermonuclear reactions, this will detonate the target fuel (10) inside the exhaust (13,14,15) where the line of force from magnetic field (12) is to avoid that the hot plasma touch the exhaust wall (13). This neutronic fuel (10) is injected by the production and injection system ~~(19,/ 20)~~ (19,20) that can be placed in an extra room (16) such for fuel manufacturing (3,10) like ~~inject~~ injecting it ~~in~~ into the exhaust (13,14,15) like in the reactor (6A). In ~~figure~~ Figure 3, the same before situation, ~~but in this case~~ but, in this case, the target (10) is cylindrical or spherical for fast ignition by direct drive, or by indirect drive with illumination by both sides (8), where the driver system (conventional laser or ~~particles beans)~~ particle beams (1) are placed out of room (16) and inside the motor external structure (17,18) and directed by mirrors (21) to the target (3) with the intention of advanced fuels detonation and with low tritium proportion or DTHe3 in target (10). In ~~figure~~ Figure ~~4~~ 4, ~~wath~~ with the change from

~~figure~~ Figure ~~3~~ 3, is the system of micro explosions retention, ~~need a cylinder(6)with great~~ needs a cylinder (6) with a greater diameter 3,5m since ~~is~~ it is to support greater detonations from ~~0,01~~ 1 to ~~0,04 ton~~ 2 tons of TNT. In ~~figure~~ Figure ~~5~~ 5, the change is the contention vessel shape that is spherical (6) where the fuel (3) after detonation by any processes (laser, ~~particles beans,~~ particle beams, z-pinch, MTF, anti-matter particles) will reach the cylinder (4) beam formation that is vaporized when attained by x-rays from fuel target (3) detonation ~~of (3)~~ that can be ~~cylindrical spherical~~ cylindrical, spherical, or ellipsoidal in fission case, that is in the micro Centurion/Halite. In ~~figure~~ Figure 6 what ~~change~~ changes is the intensity of detonation that can reach ~~0,05~~ 5 tons of TNT ~~where~~ when the system of contention is changed by another vessel in the exhaust type that is the best way to disperse the micro explosion from fuel target (3) that will ~~arrive~~ arrive at the cylinder rod (4) generating the energetic beam (8). In this ~~case~~ case, the vessel diameter is near ~~5,8m~~ 5,6m that ~~with~~ of magnetic field (7) and can be reduced to 4m, ~~or~~ by using ~~an~~ a shock absorber where the fuel mass (3) ~~if by~~ if micro fission ~~near~~ is near 1 to 3 kg, and by micro fusion between 10μg/10mg of DT, in mini fission 10g to 1kg of P_U/U (without chemical explosive ~~mass~~ mass, or initiated by ~~laser~~ laser, or micro mini explosive lenses initiated by laser) and in mini fusion like an artifact ~~called~~ called a "baseball bomb" ~~with~~ with a ~~mass~~ mass of 10kg (the ideal is much less), ~~generating~~ generated in the beam 21 GJ that is enough to initiate any advanced fuel, ~~helping to withdraw~~ causing this project to withdraw from theory, although with values between ~~0,002~~ 0,02 to ~~0,04g~~ 0,1g of P_U/U with deuterium in the ~~center~~ center, it is ~~an~~ a great improvement and to withdraw this project from theory, since the x-ray laser energy is from ~~14MJ~~ 7,2 MJ to ~~280 MJ~~ 720 MJ that has conditions to detonate T_XDHe3, with less ignition temperature than DHe3, needing the protector shield (14) but less ~~tick,~~ thick, since the present ~~laser/particles beans~~ laser/particle beams ~~made~~ produced the implosion or compression and moments before implosion to bring into action a magnetic field that ~~avoid~~ avoids loss of fuel entropy ~~like~~ as illustrated in ~~figure 1 to 3,~~ Figures 1-3, ~~madding~~ making viable the present project. In this ~~case~~ case, to send an aerolite with much mass and velocity ~~repel~~ to repel an asteroid with much mass and breakable constitution and by fission explosions to ~~make~~ produce the beam with 1kg of P_U/U or less (10% of light W54 explosions), by mini fusion to ~~make~~ produce the beam explosions with the dimensions ~~of~~ of a "baseball ~~bomb",~~ bomb," ~~but I believe,~~ and agree with the show ~~the~~ numbers, that micro fission fusion ~~to make~~ produces first

the beam with the lowest mass quantities ~~like~~ illustrated in ~~table~~ Table ~~1~~ 1, or calculations above, ~~will~~ would be possible without the need of extreme solutions, but feasible, or to model and demonstrate the system. In ~~figure~~ Figure ~~7~~ 7, the capsule (5) used in the micro fission or micro fusion, when the beam (2) ~~arrive~~ arrives the fuel (3), that after micro explosions, the x-rays from micro explosions ~~arrive~~ arrive at the cylinder (4) that has in the extremity pointed to the target (10) ~~an~~ a material (4A) transparent to x-radiation the same used in the cylinder or low Z material and in another extremity from cylinder (4) ~~an~~ a material opaque to x-radiation (4B) or high Z material ~~madding~~ producing in this manner the lasing medium to nuclear micro bomb pumped x-ray laser, since ~~is~~ it is by fission or fusion. ~~In figure~~Figure 8 ~~we see~~ illustrates the capsule (3,4,5) ~~being arrived by~~ arriving at the ~~beans~~ beams (2) that pass by orifice (6B) reaching the target ~~(3)~~ (3), the capsule ~~(3,4, 5)~~ (3,4,5) that is injected by orifice (6A) where the wall ~~tick~~ is thick, in this ~~case~~ case, is 10 cm of steel (6C) with a shell of lead in 20cm to retain the neutrons or carbon-carbon composite (6D) for the neutrons that do not reach the coil (7) that will ~~make~~ produce the magnetic field. A particular case is when the energetic beam is only a hollow particle beam (2) perpendicular to the target axis (3) having the configuration ~~of figure~~ illustrated in Figure 15 and ~~a~~ an axial magnetic field (7) that will act ~~a little~~ slightly before ~~implosion~~ implosion, being subsequently of for the micro explosions ~~arrive~~ arrive at the cylinder (4) ~~madding~~ producing the laser ~~like in figure 9~~ shown in Figure 9 or the cylinder (4) ~~are launched~~ launched separately from the target (3) by another orifice in (5) and (6). In ~~figure 10 we has~~ Figure 10, the target (10) in cylindrical shape ~~used~~ is used in the exhaust (13,14,15) ~~being that~~ as (10A) is DT and (10B) is DHe3 or another ~~neutron~~ neutron-free fuel by direct drive with the beam (8). Figure 11 ~~represents~~ illustrates the fuel (3) of ellipsoidal shape to make the beam (8) ~~made~~ produced from P_U/U (3A) e DT (3B), that is compressed in both sides by high explosives ~~to~~ to a sub critical mass, ~~like~~ as illustrated in ~~figure~~ Figure ~~12~~ 12, the fuel (3) from solid cylindrical shape containing P_U/U (3A) e DT (3B), and a normal beam. A particular case from cylindrical geometry is when adding a gold shell and is illuminated ~~by~~ by a pettawatt laser in both sides ~~madding~~ producing x-rays and a convergent cylindrical wave for compression. In ~~figure~~ Figure ~~13~~ 13, the target (10) ~~used~~ is used in the exhaust (13,14,15) ~~constituted~~ and is constituted from plastic (10D) aluminum, ~~gold~~ gold, or tantalum (10C)

and DT_X (10A) like a micro explosion seed and (10B) ~~that~~ the main fuel that can be DHe3, T_XDHe3, DHe3-DD, ~~D-Li6.~~ or D-Li6.

~~[0080]~~[0079] ~~In figure 14 we have~~Figure 14 illustrates the basic configuration ~~how~~ illustrating how to design the target (3) of nuclear fuel in the reactor or vessel of contention (6) ~~for~~ to enhance the nuclear explosion and x-radiation after explosion. According to the explosive lenses ~~method~~ method, the shell (3C) is relative to micro mini explosive lenses (from mg to g of mass) initiated ~~by~~ by a laser or classical detonators external and around, and the shell (3D) is the tamper ~~that in this case~~ that, in this case, ~~has~~ has a double finality, like a compound of ~~a~~ an explosive ~~lenses~~ lense that converts the diverging detonation wave in a converging shock wave, beyond ~~to~~ the model in terms of ~~radiation~~ radiation, the explosion products like in W71 ~~were use~~ gold was used to enhance x-radiation and like a tamper, or ~~thallium~~ thallium, or tantalum to produce gamma radiation in the 1200 MeV ~~from~~ from the nuclear micro explosion. The shell (3E) is relative to the neutron reflector and may ~~be~~ be of beryllium or uranium and the shell ~~(3A)~~ (3A), the fissile ~~material~~ material, and ~~(3B) the DT~~ (3B), the DT, to boost fission. A particular case is when the target (3) is arrived by a pettawatt ~~laser~~ laser, then the shell (3C) is gold when vaporized gene rate x-rays, the shell (3D) is the pusher being plastic or other low Z ~~material~~ material, the outer shells are the same in cylindrical or spherical geometry. In ~~figure 15~~ Figure 15, the external shell of explosive lenses (3C) can be substituted by a z-pinch ~~system~~ system, wire array ~~z-pinch~~ z-pinch, or ~~MTF~~ MTF, with the magnetic field (3C) obtained by superconductor of millimeter size, ~~feed~~ fed by ~~an~~ a capacitor bank that is linked by means of transmission lines (3F) to the target set (3A, 3E, 3D, 3C) or without some ~~shells~~ shells, ~~according~~ according to each case. In ~~figure 16~~ Figure 16, the basic target (3,10) configuration for fusion fast ignition concept ~~used~~ is used, as well as for fuel (3) in the reactor (6) or for fuel (10) in the exhaust (13,14,15) in cylindrical or spherical geometries by direct drive or indirect drive, being (3/10F) the gold cone for the ~~ignitor~~ ignitor, in each case. In reactor ~~(6)~~ (6), or vessel of ~~contention~~ contention, the target (3) is bombarded ~~by~~ by a pettawatt laser (2A) or ignitor, and the external shell (3/10C) ~~by~~ by a laser or ~~particles beans~~ particle beams (2) for the compressor. In exhaust ~~(13,14,15)~~ (13,14,15), the ~~compressor~~ compressors are laser and ~~particles beans~~ particle beams (2) and the present invention ~~beans~~ beams (8) for fast ignition with the mean fuel (10), advanced fuels. By indirect drive because lasers can be focused to heat very small spots, even

relatively small lasers can achieve high temperatures in hohlraums. For this ~~reason is~~ reason, normal cylindrical hohlhaums (3,10) with spherical target inside of the cylinder, ~~is~~ are bombarded ~~by~~ from both ~~side~~ sides with compressor ~~beans~~ beams (2) that deposit their energy in one side and the ignition ~~beans~~ beams (2A,8) deposit their energy ~~by~~ in another side with the gold cone linked directly to the target sphere inside the cylinder. Many other configurations ~~can be~~ are possible. ~~In figure 17 we have~~Figure 17 illustrates the injector system (19) from the exhaust ~~(13,14, 15)~~ (13,14,15) ~~by~~ by a gas trigger that is constituted from a gas reservoir (19A), and a control valve (19B) to control pressure, temperature, ~~etc~~ etc., inside the initial tube (19) and a cryostat (19C) to store the targets (10) that will be injected and ~~come~~ produced ~~from~~ in the production system (20), ~~needing then to remove~~ and remove the gas to ~~an~~ a reservoir (19D) by means of suction bombs (19E) linked to the reservoir (19D). The target (10) trajectory is traced by detectors or photodiodes or laser diodes (19F1 e 19F2) ~~and~~ and a camera system (19G) and ~~to transmit~~ is transmitted ~~for~~ to a computer ~~that, calculate~~ that calculates the target position.

~~[0081]~~[0080] ~~To finalize,~~Finally, the injector system (19) for nuclear fuel (3) is by electromagnetic or electrodynamics means, since inside ~~capsule(5)~~ the capsule (5) can be placed very small iron fragments to facilitate in the injection system (19) and positioning in the place were haven't the cylinder rod (4). The production system (20) of fuel (3) to reactor room (6) in case of micro fusion is by cryogenics and of fuel (10) is by polymerization and stored in a cryostat that is ~~after~~ later linked in the injector system (19).

~~Abstract:~~ ABSTRACT OF THE DISCLOSURE

A propulsion motor for rockets and spaceships ~~comprises~~ comprising two cylindrical rings (17) linked by means of a bar (18) forming the motor external structure (17,18) and an exhaust (13,14,15) linked to a third cylindrical ring (17A) and to a reactor room (16) where nuclear fuel (3) explodes and generates a beam (8) directed to another nuclear fuel (10) inside the exhaust (13,14,15) which ~~produces~~ produces a ~~thrust~~ thrust to a reflector magnetic field (12) ~~avoids that~~ and the hot plasma avoids touching ~~touches~~ the exhaust wall (13). To initiate reactions in the reactor vessel (6) and in the exhaust (13,14,15) an injection system (19) and a production system (20) the fuel (3,10) are needed.

N:\3129\6838\pat.app.revised.redlined.doc